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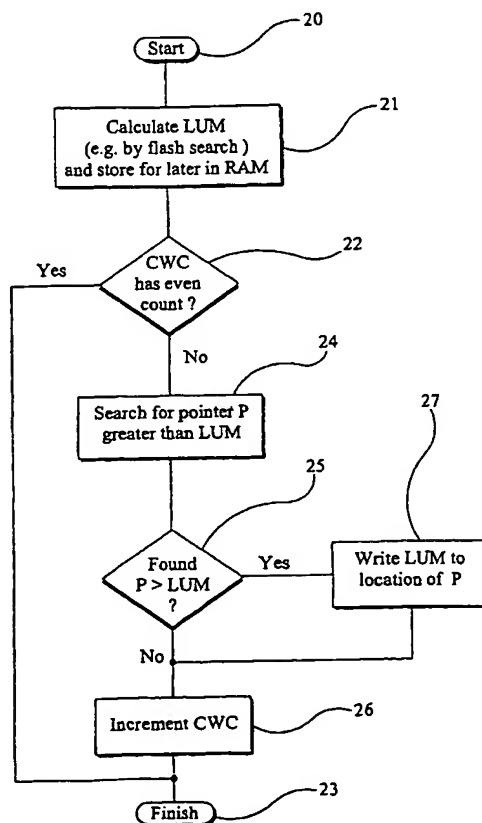
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(54) Title: METHOD OF AND APPARATUS FOR DETECTING AN ERROR IN WRITING TO PERSISTENT MEMORY



(57) Abstract: A technique is provided for detecting errors in persistent memory, such as flash memory, where values of data items are stored at memory locations added consecutively to one end of the already-allocated memory segment. When a new location is added, a pointer to the address of the new location is stored at the location of a preceding value for that item. The address of the latest location is determined (21) whenever power is reapplied. The pointer fields of the locations are searched (24) for any pointer whose value is greater than the address of the last location. If such a pointer value is found, this indicates that an error occurred when writing the pointer value, for example because power was removed before completion of the pointer writing cycle. The error can be corrected by changing the pointer value to the address of the last location (27).



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B. FIELDS SEARCHED

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Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 412 080 B1 (FLEMING MICHAEL K ET AL) 25 June 2002 (2002-06-25) abstract; figure 3A column 6, line 27 - column 7, line 6 ---	1-31
A	WO 00 68794 A (WEISS DIETER ; GIESECKE & DEVRIENT GMBH (DE)) 16 November 2000 (2000-11-16) abstract; figure 3 page 2 - page 6 ---	1-31
A	EP 0 834 882 A (NOKIA MOBILE PHONES LTD) 8 April 1998 (1998-04-08) column 2, line 5 - line 28 ---	1-31
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 241 677 A (NIPPON ELECTRIC CO) 18 September 2002 (2002-09-18) figures 12A-13D paragraph '0041! - paragraph '0046! paragraph '0081! - paragraph '0104! -----	1-31
A	EP 0 398 545 A (DELCO ELECTRONICS CORP) 22 November 1990 (1990-11-22) abstract; figures 1A-1E -----	1-31

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6412080	B1	25-06-2002	NONE	
WO 0068794	A	16-11-2000	DE 19921232 A1	16-11-2000
			AT 246821 T	15-08-2003
			AU 4755000 A	21-11-2000
			CN 1359493 T	17-07-2002
			DE 50003203 D1	11-09-2003
			WO 0068794 A1	16-11-2000
			EP 1190324 A1	27-03-2002
			JP 2002544590 T	24-12-2002
			US 6622205 B1	16-09-2003
EP 0834882	A	08-04-1998	GB 2317722 A	01-04-1998
			DE 69710665 D1	04-04-2002
			DE 69710665 T2	21-11-2002
			EP 0834882 A2	08-04-1998
			JP 10133940 A	22-05-1998
			US 2001002475 A1	31-05-2001
EP 1241677	A	18-09-2002	JP 2002278850 A	27-09-2002
			EP 1241677 A1	18-09-2002
EP 0398545	A	22-11-1990	EP 0398545 A1	22-11-1990
			JP 3019053 A	28-01-1991